

PUBLICATION:

Olenina, I., Wasmund, N., Hajdu, S., Jurgensone, I., Gromisz, S., Kownacka, J., Toming, K., Vaiciute, D., Olenin, S. 2010. Assessing impacts of invasive phytoplankton: The Baltic Sea case. Marine Pollution Bulletin, 60 (2010) 1691–1700

BINPAS DATA:

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, South-Eastern Baltic Sea, Lithuanian coastal waters (1995 - 1999)
ADR:	E
ADR confidence level:	High
ADR comments:	Mass development of <i>P. minimum</i> occurred in 1995 with densities up to 1.2 million cells/litre (up to 51% from total phytoplankton abundance and up to 81% from total biomass). In the near-shore areas in 1999 it reached 7.8 million cells/litre, corresponding to 96% of total phytoplankton abundance and 95% of total biomass.
ADR references:	Lithuanian national phytoplankton monitoring data (Centre of Marine Research, Klaipeda, Lithuania); Hajdu S, Edler L, Olenina I, Witek B (2000) Spreading and Establishment of the Potentially Toxic Dinoflagellate <i>Prorocentrum minimum</i> in the Baltic Sea. Internat. Rev. Hydrobiol. 85(5-6): 561
Impact on communities:	C3
Impact on com. confidence level:	High
Impact on com. comments:	During the mass development periods <i>P. minimum</i> dominated the community. The relative abundance of native former dominant species was severely reduced.
Impact on habitats:	H2
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Changes of water color and pH increase were observed during the mass development of <i>P. minimum</i> . Other impacts on habitat are unknown.
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore it may be stated that at least shifts in dominant functional groups have happened because in late summer - autumn period usually autotrophic diatoms and cyanobacteria have been dominants in plankton. Other impacts on ecosystem are unknown.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	3
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, South-Eastern Baltic Sea, Lithuanian coastal waters (1990 - 1994)
ADR:	A
ADR confidence level:	Low
ADR comments:	For first time species was found in 1992; the maximum abundance of the species during this period was 1700 cells per litre, the max share of total phytoplankton biomass -3%
ADR references:	Lithuanian national phytoplankton monitoring data (Centre of Marine Research, Klaipeda, Lithuania); Hajdu S, Edler L, Olenina I, Witek B (2000) Spreading and Establishment of the Potentially Toxic Dinoflagellate Prorocentrum minimum in the Baltic Sea. Internat. Rev. Hydrobiol. 85 (5-6): 561
Impact on communities:	C0
Impact on com. confidence level:	High
Impact on com. comments:	Appearance of P. minimum did not change the phytoplankton structure in this period because the species was not abundant and its distribution in the area was confined to three localities only
Impact on habitats:	H0
Impact on hab. confidence level:	High
Impact on hab. comments:	Appearance of P. minimum in the area did not change the habitat, because the abundance of the species was low, no coloration of water, no chemical changes were observed.
Impact on ecosystems:	C0
Impact on eco. confidence level:	Medium
Impact on eco. comments:	No changes: P. minimum is known as mixotroph (Stoecker et al 1997), however there were other (native) mixotrophic species in the system and P. minimum abundance in this period was very low.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate Prorocentrum minimum. Mar Ecol Prog Ser 152: 1-12
BPL:	0
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, South-Eastern Baltic Sea, Lithuanian coastal waters (2000 - 2004)
ADR:	E
ADR confidence level:	High
ADR comments:	During 2003 mass development period P. minimum max abundance reached up to 29 million cells per litre and its share in total phytoplankton biomass reached 88%, species was found in all localities
ADR references:	Lithuanian national phytoplankton monitoring data (Centre of Marine Research, Klaipeda, Lithuania)

Impact on communities:	C3
Impact on com. confidence level:	High
Impact on com. comments:	During 2003 mass development period <i>P. minimum</i> dominated the community. Max abundance of the species was about 29 million cells per litre. The relative abundance of native former dominant species was severely reduced, the share of <i>P. minimum</i> in total phytoplankton biomass reached 88%.
Impact on habitats:	H2
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Changes in water color observed during the mass development of <i>P. minimum</i> (I. Olenina, pers. observation). Changes of water pH were observed in the places of mass development of <i>P. minimum</i> (acc. to chemical monitoring data). The species seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al., 1997) therefore it may be stated that at least shifts in dominant functional groups have happened because in late summer - autumn period usually autotrophic diatoms and cyanobacteria have been dominants in plankton. Other impacts on ecosystem are unknown.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	3
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, South-Eastern Baltic Sea, Lithuanian coastal waters (2005 - 2008)
ADR:	C
ADR confidence level:	Medium
ADR comments:	Species max abundance during this period reached 123700 cells per litre, species was found in almost all localities (20 stations out of 24).
ADR references:	Lithuanian national phytoplankton monitoring data (Centre of Marine Research, Klaipeda, Lithuania)
Impact on communities:	C1
Impact on com. confidence level:	High
Impact on com. comments:	During this period the share of <i>P. minimum</i> in total phytoplankton biomass did not exceed 18%. Changes in ranking of native species were observed, but dominant species remained the same.

Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown
Impact on ecosystems:	C1
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, South-Eastern Baltic Sea, Latvian coastal waters (1995 - 1999)
ADR:	A
ADR confidence level:	Low
ADR comments:	Max abundance of <i>P. minimum</i> during this period was about 4000 cells per litre, species found in a few localities Latvian national phytoplankton monitoring data (Data presented by Iveta Jurgensone, Latvian Inst. of Aquatic Ecology, Marine Monitoring Centre, Daugavgrivas str. 8, LV-1048 Riga, Latvia, iveta@monit.lu.lv)
ADR references:	
Impact on communities:	C0
Impact on com. confidence level:	High
Impact on com. comments:	The share of <i>P. minimum</i> in total phytoplankton biomass didn't exceed 1%
Impact on habitats:	H0
Impact on hab. confidence level:	Medium
Impact on hab. comments:	No altering of water colour and of nutrient content was observed.
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group: <i>P. minimum</i> is known as mixotroph (Stoecker et al., 1997), however there were other (native) mixotrophic species in the system
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	0

Contributor:

Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, South-Eastern Baltic Sea, Latvian coastal waters (2000 - 2004)
ADR:	A
ADR confidence level:	High
ADR comments:	Max P. minimum abundance during this period was about 1700 cells per litre, the species occurred in a few localities
ADR references:	Latvian national phytoplankton monitoring data. (Data presented by Iveta Jurgensone , Latvian Inst. of Aquatic Ecology, Marine Monitoring Centre, Daugavgrivas str.8, LV-1048 Riga, Latvia, iveta@moni.tlu.lv)
Impact on communities:	C0
Impact on com. confidence level:	High
Impact on com. comments:	P. minimum share in the total phytoplankton biomass did not exceed 1%, no quantitative changes in community structure was observed
Impact on habitats:	H0
Impact on hab. confidence level:	Medium
Impact on hab. comments:	No altering of water colour and nutrient content was observed
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group: P. minimum is known as mixotroph (Stoecker et al., 1997), however there were other (native) mixotrophic species in the system
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate Prorocentrum minimum. Mar Ecol Prog Ser 152: 1-12
BPL:	0
Contributor:	Irina Olenina

Species name:

Prorocentrum minimum

Assessment unit account:

Baltic, South-Eastern Baltic Sea, Latvian coastal waters (2005 - 2008)

ADR:

B

ADR confidence level:

High

ADR comments:

Species max abundance during this period reached 115040 cells per litre, species was found in a few localities

ADR references:

Latvian national phytoplankton monitoring data. (Data presented by Iveta Jurgensone , Latvian Inst. of Aquatic Ecology, Marine Monitoring Centre, Daugavgrivas str.8, LV-1048 Riga, Latvia, iveta@moni.tlu.lv)

Impact on communities:	C1
Impact on com. confidence level:	High
Impact on com. comments:	During this period the share of <i>P. minimum</i> in total phytoplankton biomass reached 45%. Changes in ranking of native species were observed, but dominant species remained the same.
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on ecosystems:	C1
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . <i>Mar Ecol Prog Ser</i> 152: 1-12
BPL:	1
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Tallinn and Muuga Bay, North-Eastern Baltic Sea, Estonian coastal waters (1990 - 1994)
ADR:	A
ADR confidence level:	Medium
ADR comments:	Species was found only at one locality with abundance about 2450 cells per litre Estonian national phytoplankton monitoring data (Data presented by Kaire Toming, Estonian Marine Institute, Tartu University,
ADR references:	M
Impact on communities:	C0
Impact on com. confidence level:	Medium
Impact on com. comments:	During this period the share of <i>P. minimum</i> in total phytoplankton biomass did not exceed 1,5%.
Impact on habitats:	H0

Impact on hab. confidence level:	Low
Impact on hab. comments:	No altering of water colour and nutrient content was observed
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group: <i>P. minimum</i> is known as mixotroh (Stoecker et al 1997), however there were other (native) mixotrophic species in the system
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	0
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Tallinn and Muuga Bay, North-Eastern Baltic Sea, Estonian coastal waters (1995 - 1999)
ADR:	B
ADR confidence level:	High
ADR comments:	During this period <i>P. minimum</i> reached 766400 cells per litre, but was found in few localities only
ADR references:	Estonian national phytoplankton monitoring data (Data presented by Kaire Toming, Estonian Marine Institute, Tartu University,
Impact on communities:	M
Impact on com. confidence level:	C2
Impact on com. comments:	Medium
Impact on habitats:	P. minimum dominated the community (46%) during the mass development periods in September in 1999
Impact on hab. confidence level:	H1
Impact on hab. comments:	Low
Impact on hab. references:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on ecosystems:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on eco. confidence level:	C2
Impact on eco. comments:	Low
	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic

Impact on eco. references:	species in the system, increasing of their role is expected.
BPL:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
Contributor:	2 Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Tallinn and Muuga Bay, North-Eastern Baltic Sea, Estonian coastal waters (2000 - 2004)
ADR:	C
ADR confidence level:	High
ADR comments:	During 2003 mass development period <i>P. minimum</i> dominated the community. Max abundance of the species was about 534 thousand cells per litre and its share in total phytoplankton biomass reached 60%.
ADR references:	Estonian national phytoplankton monitoring data (Data presented by Kaire Toming, Estonian Marine Institute, Tartu University, M
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	<i>P. minimum</i> dominated the community during the mass development periods in September 2003
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2

Contributor:

Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Tallinn and Muuga Bay, North-Eastern Baltic Sea, Estonian coastal waters (2005 - 2008)
ADR:	A
ADR confidence level:	High
ADR comments:	Max P. minimum abundance during this period was about 5000 cells per litre, the species occurred in a few localities
ADR references:	Estonian national phytoplankton monitoring data (Data presented by Kaire Toming, Estonian Marine Institute, Tartu University,
	M
Impact on communities:	C0
Impact on com. confidence level:	Medium
Impact on com. comments:	P. minimum did not change the phytoplankton structure because the species was not abundant (<1% from total phytoplankton biomass) and its distribution in the area was confined to few localities only
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	Altering of water colour and nutrient content unknown
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group: P. minimum is known as mixotroph (Stoecker et al., 1997), however there were other (native) mixotrophic species in the system
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate Prorocentrum minimum. Mar Ecol Prog Ser 152: 1-12
BPL:	0
Contributor:	Irina Olenina

Species name:

Prorocentrum minimum

Assessment unit account:

Baltic, Northern Baltic Sea proper, Landsortdeep, Swedish off-shore waters (1990 - 1994)

ADR:

A

ADR confidence level:

Low

ADR comments:

Area described by data from one sampling site only.

Species max abundance during this period reached 600 cells per litre, relative biomass - 0,1%.

ADR references:

Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems

Impact on communities:	Ecology, Stockholm University, Svante Arrhenius v
Impact on com. confidence level:	C0
Impact on com. comments:	Low The abundance of <i>P. minimum</i> was very low, no effect on the phytoplankton community was observed
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	No impacts on habitat was observed
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No impacts on ecosystem functioning was observed
BPL:	0
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Northern Baltic Sea proper, Landsortdeep, Swedish off-shore waters (1995 - 1999)
ADR:	B
ADR confidence level:	Medium
ADR comments:	Area described by data from one sampling site only. Species max abundance during this period reached 112320 cells per litre, relative biomass - 57%.
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C2
Impact on com. confidence level:	High
Impact on com. comments:	During a short period in 1997 <i>P. minimum</i> dominated the community. The relative abundance of native former dominant species was reduced.
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481

Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Northern Baltic Sea proper, Landsortdeep, Swedish off-shore waters (2000 - 2004)
ADR:	B
ADR confidence level:	Low
ADR comments:	Area described by data from one sampling site only. max abundance during this period reached 77200 cells per litre, relative biomass - 31%.
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C2
Impact on com. confidence level:	High
Impact on com. comments:	During a short period in 2002 and 2003 <i>P. minimum</i> dominated the community.
Impact on habitats:	H1
Impact on hab. confidence level:	High
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum</i>

BPL:	minimum. Mar Ecol Prog Ser 152: 1-12
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Northern Baltic Sea proper, Landsortdeep, Swedish off-shore waters (2005 - 2008)
ADR:	A
ADR confidence level:	Low
ADR comments:	Area described by data from one sampling site only. Species max abundance during this period reached 480 cells per litre, relative biomass - 1%.
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C0
Impact on com. confidence level:	Low
Impact on com. comments:	P. minimum did not change the phytoplankton structure because the species was not abundant
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	No impacts on habitat was observed
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No impacts on ecosystem functioning was observed
BPL:	0
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Northern Baltic Sea proper, Ask (1985 - 1989)
ADR:	A
ADR confidence level:	Low
ADR comments:	Area described by data from one sampling site only. Species max abundance during this period reached 9680 cells per litre, relative biomass - 5%
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v

Impact on communities:	C0
Impact on com. confidence level:	Low
Impact on com. comments:	Appearance of <i>P. minimum</i> did not change the phytoplankton structure because the species was not abundant
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	No impacts was observed
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No impacts was observed
BPL:	0
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Northern Baltic Sea proper, Ask (1990 - 1994)
ADR:	D
ADR confidence level:	Medium
ADR comments:	Area described by data from one sampling site only. Species max abundance during this period reached 415300 cells per litre, relative biomass - 85%. It was assumed that species should be found in many localities of the area (expert judgment).
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C3
Impact on com. confidence level:	Medium
Impact on com. comments:	During 1992 mass development period <i>P. minimum</i> dominated the community. The relative abundance of native former dominant species was severely reduced during the bloom. The data from one locality was extrapolated to the entire area (expert judgment).
Impact on habitats:	H2
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the

Impact on ecosystems:	nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on eco. confidence level:	C3
Impact on eco. comments:	Low The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, it may be stated that at least shifts in dominant functional groups have happened because in autumn period usually autotrophic diatoms have been dominant in plankton of the area
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	3
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Northern Baltic Sea proper, Ask (1995 - 1999)
ADR:	A
ADR confidence level:	Low
ADR comments:	Area described by data from one sampling site only. Species max abundance during this period reached 9760 cells per litre, relative biomass - 8%.
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C0
Impact on com. confidence level:	Low
Impact on com. comments:	No measurable effect was observed
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	No measurable effect was observed
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No measurable effect was observed. No addition of a new functional group: <i>P. minimum</i> is known as mixotroph (Stoecker et al., 1997), however there were other (native) mixotrophic species in the system.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	0
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Northern Baltic Sea proper, Ask (2000 - 2004)
ADR:	D
ADR confidence level:	Medium
ADR comments:	Area described by data from one sampling site only, but the species abundance here was high - 240840 cells per litre, the relative P.minimum biomass reached 84%. It was assumed that species should be found in many localities of the area (expert judgment)
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C3
Impact on com. confidence level:	Medium
Impact on com. comments:	During 2003 mass development period P. minimum dominated the community, the relative biomass of native former dominant species was severely reduced during the bloom. The data from one locality was extrapolated to the entire area (expert judgment).
Impact on habitats:	H2
Impact on hab. confidence level:	Low
Impact on hab. comments:	P. minimum seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005). Other impacts are unknown.
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of Prorocentrum minimum (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, it may be stated that at least shifts in dominant functional groups have happened because in autumn period usually autotrophic diatoms have been dominant in plankton of the area.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate Prorocentrum minimum. Mar Ecol Prog Ser 152: 1-12
BPL:	3
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Northern Baltic Sea proper, Ask (2005 - 2008)

ADR:	A
ADR confidence level:	High
ADR comments:	Area described by data from one sampling site only. Species max abundance during this period reached 1680 cells per litre, relative biomass - 5%.
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C0
Impact on com. confidence level:	Medium
Impact on com. comments:	Species was not abundant, no measurable effect on native phytoplankton was observed. The data from one locality was extrapolated to the entire area (expert judgment).
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	Species was not abundant, no measurable effect on habitat was observed. The data from one locality was extrapolated to the entire area (expert judgment).
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	Species was not abundant, no measurable effect on ecosystem functioning was observed. The data from one locality was extrapolated to the entire area (expert judgment).
BPL:	0
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Northern Baltic Sea proper, Himmerfj (1990 - 1994)
ADR:	D
ADR confidence level:	Medium
ADR comments:	Area described by data from few sampling site only (we did not studied all stations during this period), but the species abundance here was high - 960120 cells per litre, the relative P.minimum biomass reached 81%. It was assumed that species should be found in many localities of the area (expert judgment)
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C3
Impact on com. confidence level:	Medium
Impact on com. comments:	During the mass development periods in 1992 P. minimum dominated the community, the relative abundance of

Impact on habitats:	native former dominant species was severely reduced during the bloom.
Impact on hab. confidence level:	H2
Impact on hab. comments:	Could be discoloration of water during the mass development of <i>P. minimum</i> , but no sign was made on it. Also, <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, it may be stated that at least shifts in dominant functional groups have happened because in autumn period usually autotrophic diatoms have been dominant in plankton of the area
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	3
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Northern Baltic Sea proper, Himmerfj (1995 - 1999)
ADR:	D
ADR confidence level:	Medium
ADR comments:	Area described by data from few sampling site only, but the species abundance here was high - 871360 cells per litre, the relative <i>P. minimum</i> biomass reached 86%. It was assumed that species should be found in many localities of the area (expert judgment).
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C3
Impact on com. confidence level:	High
Impact on com. comments:	During the mass development periods in 1997 <i>P. minimum</i> dominated the community, the relative abundance of native former dominant species was severely reduced during the bloom.
Impact on habitats:	H2
Impact on hab. confidence level:	Low

Impact on hab. comments:	Could be discoloration of water during the mass development of <i>P. minimum</i> , but no sign was made on it. Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, it may be stated that at least shifts in dominant functional groups have happened because in autumn period usually autotrophic diatoms have been dominant in plankton of the area.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . <i>Mar Ecol Prog Ser</i> 152: 1-12
BPL:	3
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Northern Baltic Sea proper, Himmerfj (2000 - 2004)
ADR:	D
ADR confidence level:	High
ADR comments:	During 2002, 2003 mass development period <i>P. minimum</i> max abundance reached 1023848 cells per litre and the share in total phytoplankton biomass reached 97%.
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C3
Impact on com. confidence level:	High
Impact on com. comments:	During the mass development periods in 2002 and 2003 <i>P. minimum</i> dominated the community, the relative abundance of native former dominant species was severely reduced during the bloom.
Impact on habitats:	H2
Impact on hab. confidence level:	Low
Impact on hab. comments:	Could be discoloration of water during the mass development of <i>P. minimum</i> , but no sign was made on it. Also, <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).

Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, it may be stated that at least shifts in dominant functional groups have happened because in autumn period usually autotrophic diatoms have been dominant in plankton of the area.
BPL:	3
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Northern Baltic Sea proper, Himmerfj (2005 - 2008)
ADR:	A
ADR confidence level:	High
ADR comments:	Species max abundance during this period reached 1600 cells per litre; max relative biomass - 1,3%; species was found in a few localities
ADR references:	Swedish national phytoplankton monitoring data (the data presented by Dr. Susanna Hajdu, Dept. of Systems Ecology, Stockholm University, Svante Arrhenius v
Impact on communities:	C0
Impact on com. confidence level:	High
Impact on com. comments:	P. minimum did not change the phytoplankton structure because the species was not abundant and its distribution in the area was confined to few localities only
Impact on habitats:	H0
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Species was not abundant, no measurable effect on habitat was observed.
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group: P. minimum is known as mixotroph (Stoecker et al., 1997), however there were other (native) mixotrophic species in the system
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	0
Contributor:	Irina Olenina

Species name: *Prorocentrum minimum*

Assessment unit account:	Baltic, Southern Baltic Proper, Polish coastal waters (1985 - 1989)
ADR:	B
ADR confidence level:	Medium
ADR comments:	Max P. minimum abundance during this period was about 300000 cells per litre, the species occurred in a few localities
ADR references:	Polish national phytoplankton data; Mackiewicz T (1995) Nanoplankton Zatoki Gdańskiej, Studia i Materiały MIR, seria A, Nr 32. Bralewska J, Witek Z (1995) Heterotrophic dinoflagellates in the ecosystem of the Gulf of Gdańsk, Mar. Ecol. Prog. Ser. 117: 241-248.
Impact on communities:	C1
Impact on com. confidence level:	Low
Impact on com. comments:	Species abundance during this period was at moderate level
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. P. minimum seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C1
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	1
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Southern Baltic Proper, Polish coastal waters (1990 - 1994)
ADR:	C
ADR confidence level:	High

ADR comments:	Species max abundance during this period reached 48776 cells per litre and reached up to 30% from total phytoplankton biomass, species was found in many localities
ADR references:	Polish national phytoplankton data (the data presented by Janina Kownacka and Slawka Gromisz, Sea Fisheries Inst., Kołłataja 1, PL 81-332 Gdynia, Poland)
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	Change in ranking of native species (decrease in domination of diatoms in relation to typical autumn phytoplankton was observed), but dominant species remained the same.
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. P. minimum seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Southern Baltic Proper, Polish coastal waters (1995 - 1999)
ADR:	E
ADR confidence level:	High
ADR comments:	Mass development of P.minimum (with abundance up to 350 million cells per litre) was observed in 1997. Species occurred at all localities.
ADR references:	Polish national phytoplankton data (the data presented by Janina Kownacka and Slawka Gromisz, Sea Fisheries Inst., Kołłataja 1, PL 81-332 Gdynia, Poland); Witek B, Pliński M (2000) The first recorded bloom of <i>Prorocentrum minimum</i> (Pavillard) Schiller in the coastal

Impact on communities:	zone of the Gulf of Gdańsk, Oceanologia, 42(1): 29-36.
Impact on com. confidence level:	Gromisz S, Witek Z (2001) Main phytoplankton assemblages in the Gulf of Gdańsk and the Pomeranian Bay from 1994 to 1997, Bull. Sea Fish. Inst., 2 (153): 31-51
Impact on com. comments:	C4
Impact on habitats:	High
Impact on hab. confidence level:	During 1997 mass development period <i>P. minimum</i> dominated the community comprising 98% of total phytoplankton biomass. The relative abundance of native former dominant species was severely reduced.
Impact on hab. comments:	H3
Impact on hab. references:	Low
Impact on ecosystems:	Discoloration of water observed during the mass development of <i>P. minimum</i> (S. Gromisz, pers. observation; Witek&Pliński 2000), algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on eco. confidence level:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on eco. comments:	C4
Impact on eco. references:	Low
BPL:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, it may be stated that at least shifts in dominant functional groups have happened because in autumn period usually autotrophic diatoms have been dominant in plankton of the area. During the mass development of <i>P. minimum</i> mixotrophs comprised more than 98% of total phytoplankton biomass. Other impacts are unknown
Contributor:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Southern Baltic Proper, Polish coastal waters (2000 - 2004)
ADR:	B
ADR confidence level:	High
ADR comments:	Max <i>P. minimum</i> abundance during this period was about 13360 cells per litre, the species occurred at many localities
ADR references:	Polish national phytoplankton data (the data presented by Janina Kownacka and Slawka Gromisz, Sea Fisheries Inst., Kołtajka 1, PL 81-332 Gdynia, Poland)

Impact on communities:	C1
Impact on com. confidence level:	Medium
Impact on com. comments:	Small change in ranking of native species was observed, but dominant species remained the same.
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	No altering of water colour and nutrient content was observed, other impacts are unknown
Impact on ecosystems:	C1
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group: <i>P. minimum</i> is known as mixotroph (Stoecker et al., 1997), however there were other (native) mixotrophic species in the system, other impacts are unknown
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	1
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Southern Baltic Proper, Polish coastal waters (2005 - 2008)
ADR:	C
ADR confidence level:	High
ADR comments:	Species max abundance during this period reached 161790 cells per litre, species was found in almost all localities Polish national phytoplankton data (the data presented by Janina Kownacka and Slawka Gromisz, Sea Fisheries Inst., Kołataja 1, PL 81-332 Gdynia, Poland)
ADR references:	
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	Decrease of the domination of diatoms in relation to typical autumn phytoplankton was observed, but dominant species remained the same.
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the

Impact on ecosystems:	nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on eco. confidence level:	C2
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (1980 - 1984)
ADR:	B
ADR confidence level:	Medium
ADR comments:	Species max abundance during this period reached 100050 cells per litre, relative biomass - 4% from total phytoplankton biomass. Species found mainly in Kiel Bight but rarely in Mecklenburg Bight.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C0
Impact on com. confidence level:	Medium
Impact on com. comments:	No quantitative changes in community structure was observed, other impacts are unknown
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	No altering of water colour and nutrient content was observed, other impacts are unknown
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group: <i>P. minimum</i> is known as mixotrophic (Stoecker et al., 1997), however there are other (native) mixotrophic species in the system
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	1
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (1985 - 1989)
ADR:	D
ADR confidence level:	Medium
ADR comments:	Mass developments of <i>P. minimum</i> were observed in Mecklenburg Bight in 1986 and 1989. Max abundance of the species reached 384000 cells per litre and the share in total phytoplankton biomass exceeded 90%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C3
Impact on com. confidence level:	Medium
Impact on com. comments:	Strong dominance of <i>P. minimum</i> during mass development periods in 1986 and 1989 was observed, the relative biomass of native former dominant species was severely reduced.
Impact on habitats:	H2
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients; no altering of water colour was observed; other impacts are unknown
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore it may be stated that at least shifts in dominant functional groups have happened because before, usually autotrophic dinoflagellates have been dominant in plankton in this area.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	3
Contributor:	Irina Olenina
Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (1990 - 1994)
ADR:	E
ADR confidence level:	Medium
ADR comments:	Mass development of <i>P. minimum</i> (with abundance up to 743500 cells per litre) was observed in 1994. Species occurred at all localities. Max relative biomass - 61%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119

Impact on communities:	Warnem
Impact on com. confidence level:	C3
Impact on com. comments:	Medium Strong dominance of <i>P.minimum</i> during mass development in 1994 was observed, the relative biomass of native former dominant species was severely reduced.
Impact on habitats:	H2
Impact on hab. confidence level:	Medium
Impact on hab. comments:	<i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005). No altering of water colour was observed; other impacts are unknown.
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore it may be stated that at least shifts in dominant functional groups have happened because in this period usually autotrophic dinoflagellates have been dominant in plankton.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	3
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (1995 - 1999)
ADR:	C
ADR confidence level:	Medium
ADR comments:	Abundance peak in 1997 in Mecklenburg Bight, max <i>P. minimum</i> abundance during this period was about 1,1 million cells per litre, relative biomass -38%; the species occurred in many localities
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	The relative abundance of native former dominant species was reduced.

Impact on habitats:	H2
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients; no altering of water colour was observed; other impacts are unknown
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore it may be stated that at least shifts in dominant functional groups have happened because in this period usually autotrophic dinoflagellates have been dominant in plankton.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (2000 - 2004)
ADR:	D
ADR confidence level:	Medium
ADR comments:	Mass developments of <i>P. minimum</i> were observed in Mecklenburg Bight in 2002. Max abundance of the species reached 383150 cells per litre and the share in total phytoplankton biomass - 52%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	Strong dominance of <i>P. minimum</i> during mass development in 2002 in Mecklenburg Bight was observed, the relative abundance of native former dominant species was severely reduced.
Impact on habitats:	H1
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients; no altering of water colour was observed; other impacts are unknown
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore it may be stated that at least shifts in dominant

Impact on eco. references:	functional groups have happened because in this period usually autotrophic dinoflagellates have been dominant in plankton. Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina
Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (2005 - 2008)
ADR:	B
ADR confidence level:	Low
ADR comments:	Data of 2005 show low abundances of <i>P.minimum</i> , but data from 2006-2008 are not available. Max abundance of the species in 2005 was 1240 cells per litre and relative biomass - less than 1%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C0
Impact on com. confidence level:	Low
Impact on com. comments:	According to 2005 data (data from 2006-2008 are not available) appearance of <i>P. minimum</i> did not change the phytoplankton structure in the area because of very low abundance.
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	According to 2005 data (data from 2006-2008 are not available) <i>P. minimum</i> in the area did not change the habitat, because the abundance of the species was so low, no coloration of water, no chemical changes was observed.
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	According to 2005 data (data from 2006-2008 are not available) the species was not abundant, no measurable changes in ecosystem functioning was observed
BPL:	1
Contributor:	Irina Olenina
Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Arkona Sea (1980 - 1984)
ADR:	B

ADR confidence level:	High
ADR comments:	Species max abundance during this period reached 26535 cells per litre, relative biomass - 4%. Species was found at many localities.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C0
Impact on com. confidence level:	Medium
Impact on com. comments:	No impacts was observed
Impact on habitats:	H0
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Appearance of <i>P. minimum</i> did not change the habitat, because the abundance of the species was low: no changes in water coloration and in nutrient content was observed.
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group: <i>P. minimum</i> is known as mixotroph (Stoecker et al 1997), however there were other (native) mixotrophic species in the system
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	1
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Arkona Sea (1985 - 1989)
ADR:	D
ADR confidence level:	High
ADR comments:	Highest abundance - 404000 cells per litre was in 1989, in the western parts; maximum relative biomass - 75%; species was found in many localities
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C3
Impact on com. confidence level:	Medium
Impact on com. comments:	The relative abundance of native former dominant species was reduced, <i>P.minimum</i> dominated the phytoplankton. According to S.Pertola (2006) <i>P.minimum</i> in the Baltic Sea does not produce toxins, no data available on competition

Impact on com. references:	with native species for resources (nutrients, light, space), and also other impacts are unknown Pertola S (2006) Diffusive and ship-mediated spread of dinoflagellates in the Baltic Sea with <i>Prorocentrum minimum</i> as a special case. PHD Thesis. Finnish Institute of Marine Research, Finland.
Impact on habitats:	H2
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore it may be stated that at least shifts in dominant functional groups have happened because in this period usually autotrophic diatoms have been dominant in plankton.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	3
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Arkona Sea (1990 - 1994)
ADR:	D
ADR confidence level:	High
ADR comments:	Highest abundance in 1992 and 1994, in the western parts with maximum - 1062200 cells per litre; relative biomass - 86%; species was found in many localities
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C3
Impact on com. confidence level:	Medium
Impact on com. comments:	The relative abundance of native former dominant species was severely reduced, <i>P.minimum</i> dominated the phytoplankton. According to S.Pertola (2006) <i>P.minimum</i> in the Baltic Sea does not produce toxins, no data available on competition with native species for resources (nutrients, light, space), and other impacts are unknown
Impact on com. references:	Pertola S (2006) Diffusive and ship-mediated spread of dinoflagellates in the Baltic Sea with <i>Prorocentrum minimum</i> as a special case. PHD Thesis. Finnish Institute of Marine Research, Finland.
Impact on habitats:	H2
Impact on hab. confidence level:	Low

Impact on hab. comments:	P. minimum seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on ecosystems:	C3
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore it may be stated that at least shifts in dominant functional groups have happened because in this period usually autotrophic diatoms have been dominant in plankton.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . <i>Mar Ecol Prog Ser</i> 152: 1-12
BPL:	3
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Arkona Sea (1995 - 1999)
ADR:	C
ADR confidence level:	High
ADR comments:	Highest abundance in 1998, in the western parts; max abundance of the species reached 432000 cells per litre and the share in total phytoplankton biomass - 11%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	Changes in ranking of native species, but dominant species remained the same.
Impact on habitats:	H1
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. P. minimum seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on ecosystems:	C2

Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Arkona Sea (2000 - 2004)
ADR:	C
ADR confidence level:	High
ADR comments:	Highest abundance in 2002 and 2003; maximum - 491784 cells per litre, max relative biomass - 38%
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	Changes in ranking of native species; according to S.Pertola (2006) <i>P.minimum</i> in the Baltic Sea does not produce toxins, no data available on competition with native species for resources (nutrients, light, space), and other impacts are unknown.
Impact on com. references:	Pertola S (2006) Diffusive and ship-mediated spread of dinoflagellates in the Baltic Sea with <i>Prorocentrum minimum</i> as a special case. PHD Thesis. Finnish Institute of Marine Research, Finland.
Impact on habitats:	H1
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown.
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore it may be stated that at least shifts in dominant functional groups have happened because in autumn period usually autotrophic diatoms have been dominant in plankton.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12

BPL:	2
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Arkona Sea (2005 - 2008)
ADR:	B
ADR confidence level:	Medium
ADR comments:	During this period the maximum abundance of <i>P.minimum</i> did not exceed 1360 cells per litre, the share in total phytoplankton biomass was less than 1%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C0
Impact on com. confidence level:	Medium
Impact on com. comments:	Appearance of <i>P. minimum</i> did not change the phytoplankton structure because the species was not abundant
Impact on habitats:	H0
Impact on hab. confidence level:	Medium
Impact on hab. comments:	No altering of water colour and nutrient content was observed, other impacts are unknown
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No changes: <i>P. minimum</i> is known as mixotroph (Stoecker et al 1997), however there were other (native) mixotrophic species in the system
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	1
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Bornholm Sea (1985 - 1989)
ADR:	B
ADR confidence level:	Medium
ADR comments:	Only one locality sampled, but wide distribution expected. Abundance - 19200 cells per litre; relative biomass - 26%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem

Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	Changes in ranking of native species
Impact on habitats:	H1
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . <i>Mar Ecol Prog Ser</i> 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Bornholm Sea (1990 - 1994)
ADR:	C
ADR confidence level:	Medium
ADR comments:	During some years of this period only one locality sampled. Maximum species abundance - 389064 cells per litre; relative biomass - 82%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	The relative abundance of native former dominant species was severely reduced, <i>P. minimum</i> dominated the community. According to S.Pertola (2006) <i>P.minimum</i> in the Baltic Sea does not produce toxins, no data available on competition with native species for resources (nutrients, light, space), and other impacts are unknown.

Impact on com. references:	Pertola S (2006) Diffusive and ship-mediated spread of dinoflagellates in the Baltic Sea with <i>Prorocentrum minimum</i> as a special case. PHD Thesis. Finnish Institute of Marine Research, Finland.
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role or even shifts in dominant functional groups are expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Bornholm Sea (1995 - 1999)
ADR:	B
ADR confidence level:	Medium
ADR comments:	Highest abundances in 1997 and 1999; max - 128738 cells per litre; relative biomass - 28%
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C1
Impact on com. confidence level:	Medium
Impact on com. comments:	Changes in ranking of native species, but dominant species remained the same.
Impact on habitats:	H1
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is

Impact on hab. references:	exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on ecosystems:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on eco. confidence level:	C1
Impact on eco. comments:	Low
Impact on eco. references:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
BPL:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . <i>Mar Ecol Prog Ser</i> 152: 1-12
Contributor:	1 Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Bornholm Sea (2000 - 2004)
ADR:	B
ADR confidence level:	High
ADR comments:	Maximum abundance - 218638 cells per litre; relative biomass - 29%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C2
Impact on com. confidence level:	Medium
Impact on com. comments:	Changes in ranking of native species
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low

Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Bornholm Sea (2005 - 2008)
ADR:	B
ADR confidence level:	Medium
ADR comments:	Only one locality sampled, but wide distribution expected. The highest abundance - 85629 cells per litre; relative biomass - 39%
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C2
Impact on com. confidence level:	Low
Impact on com. comments:	Change in ranking of native species
Impact on habitats:	H2
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C2
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2

Contributor:

Irina Olenina

Species name:

Prorocentrum minimum

Assessment unit account:

Baltic, Eastern Gotland Sea (1985 - 1989)

ADR:

D

ADR confidence level:

Medium

ADR comments:

Only two localities sampled, but wide distribution expected. Maximum abundance 424000 cells per litre; relative biomass - 77%.

ADR references:

Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem

Impact on communities:

C3

Impact on com. confidence level:

Medium

Impact on com. comments:

The relative abundance of native former dominant species was reduced, P.minimum dominated the phytoplankton. According to S.Pertola (2006) P.minimum in the Baltic Sea does not produce toxins, no data available on competition with native species for resources (nutrients, light, space), and other impacts are unknown.

Impact on com. references:

Pertola S (2006) Diffusive and ship-mediated spread of dinoflagellates in the Baltic Sea with Prorocentrum minimum as a special case. PHD Thesis. Finnish Institute of Marine Research, Finland.

Impact on habitats:

H2

Impact on hab. confidence level:

Low

Impact on hab. comments:

Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. P. minimum seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).

Impact on hab. references:

Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of Prorocentrum minimum (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481

Impact on ecosystems:

C3

Impact on eco. confidence level:

Low

Impact on eco. comments:

The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role or even shifts in dominant functional groups are expected.

Impact on eco. references:

Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate Prorocentrum minimum. Mar Ecol Prog Ser 152: 1-12

BPL:

3

Contributor:

Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Eastern Gotland Sea (1990 - 1994)
ADR:	C
ADR confidence level:	Medium
ADR comments:	Only two localities sampled, but wide distribution expected. Maximum abundance - 176360 cells per litre; relative biomass - 39%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C1
Impact on com. confidence level:	Medium
Impact on com. comments:	Changes in ranking of native species
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C1
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	Prorocentrum minimum
Assessment unit account:	Baltic, Eastern Gotland Sea (1995 - 1999)
ADR:	C
ADR confidence level:	Medium
ADR comments:	Only two localities sampled, but wide distribution expected. Maximum abundance - 81158 cells per litre; relative

ADR references:	biomass - 35%. Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C1
Impact on com. confidence level:	Medium
Impact on com. comments:	Change in ranking of native species
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. <i>P. minimum</i> seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on ecosystems:	C1
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . <i>Mar Ecol Prog Ser</i> 152: 1-12
BPL:	2
Contributor:	Irina Olenina
Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Eastern Gotland Sea (2000 - 2004)
ADR:	C
ADR confidence level:	Medium
ADR comments:	Only two localities sampled, but wide distribution expected. Maximum abundance - 218628 cells per litre; relative biomass - 40%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C1
Impact on com. confidence level:	Medium

Impact on com. comments:	Change in ranking of native species
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. P. minimum seems to be a good competitor when nitrate (or other inorganic nutrient) is exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on hab. references:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? Harmful Algae 4: 481
Impact on ecosystems:	C1
Impact on eco. confidence level:	Low
Impact on eco. comments:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
Impact on eco. references:	Stoecker DK, Li A, Coats DW, Gustafson DE, Nannen MK (1997) Mixotrophy in the dinoflagellate <i>Prorocentrum minimum</i> . Mar Ecol Prog Ser 152: 1-12
BPL:	2
Contributor:	Irina Olenina

Species name:	<i>Prorocentrum minimum</i>
Assessment unit account:	Baltic, Eastern Gotland Sea (2005 - 2008)
ADR:	C
ADR confidence level:	Medium
ADR comments:	Only two localities sampled, but wide distribution expected. maximum abundance - 85629 cells per litre; relative biomass - 39%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C1
Impact on com. confidence level:	Medium
Impact on com. comments:	Change in ranking of native species
Impact on habitats:	H1
Impact on hab. confidence level:	Low
Impact on hab. comments:	Algal growth of course reduces the dissolved inorganic nutrients, but no altering of water colour was observed; other impacts are unknown. P. minimum seems to be a good competitor when nitrate (or other inorganic nutrient) is

Impact on hab. references:	exhausted from the water in the early phase of the bloom and high concentrations of total nitrogen are available (Pertola et al 2005).
Impact on ecosystems:	Pertola S, Kuosa H, Olsonen R (2005) Is the invasion of <i>Prorocentrum minimum</i> (Dinophyceae) related to the nitrogen enrichment of the Baltic Sea? <i>Harmful Algae</i> 4: 481
Impact on eco. confidence level:	C1
Impact on eco. comments:	Low
Impact on eco. references:	The species is known as mixotrophic (Stoecker et al 1997) therefore, even if there were other (native) mixotrophic species in the system, increasing of their role is expected.
BPL:	2
Contributor:	Irina Olenina
Species name:	<i>Thalassiosira punctigera</i>
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (1990 - 1994)
ADR:	B
ADR confidence level:	Medium
ADR comments:	Species max abundance during this period reached 2090 cells per litre, relative biomass - 26%; species was found at a few localities only.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C1
Impact on com. confidence level:	Low
Impact on com. comments:	Changes in ranking of native species were observed, but dominant species remained the same.
Impact on habitats:	H0
Impact on hab. confidence level:	Low
Impact on hab. comments:	No altering of water colour and nutrient content was observed, other impacts are unknown
Impact on ecosystems:	C1
Impact on eco. confidence level:	Low
Impact on eco. comments:	No impacts was observed
BPL:	1
Contributor:	Irina Olenina

Species name:	Thalassiosira punctigera
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (2000 - 2004)
ADR:	A
ADR confidence level:	Medium
ADR comments:	Species max abundance during this period reached 1480 cells per litre, relative biomass - 2%; species was found at a few localities only
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C0
Impact on com. confidence level:	Medium
Impact on com. comments:	Appearance of T.punctigera did not change the phytoplankton structure because the species was not abundant and its distribution in the area was confined to few localities only
Impact on habitats:	H0
Impact on hab. confidence level:	Medium
Impact on hab. comments:	No altering water colour, oxygen and nutrient content was observed
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No measurable effect on ecosystem functioning was observed
BPL:	0
Contributor:	Irina Olenina

Species name:	Thalassiosira punctigera
Assessment unit account:	Baltic, Belt Sea area incl. Mecklenburg Bight and Kiel Bight (2005 - 2008)
ADR:	A
ADR confidence level:	Low
ADR comments:	Data of 2005 show low abundances of T.punctigera, but data from 2006-2008 are not available. In 2005 the species max abundance only reached 400 cells per litre, relative biomass - 0,4%; species was found at a few localities
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C0
Impact on com. confidence level:	Low
Impact on com. comments:	In 2005 (other years not available) no measurable effect on community was observed
Impact on habitats:	H0

Impact on hab. confidence level:	Low
Impact on hab. comments:	In 2005 (other years not available) no measurable effect on habitat was observed
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	In 2005 (other years not available) no measurable effect on ecosystem functioning was observed
BPL:	0
Contributor:	Irina Olenina
Species name:	<i>Thalassiosira punctigera</i>
Assessment unit account:	Baltic, Arkona Sea (1990 - 1994)
ADR:	A
ADR confidence level:	Medium
ADR comments:	Species was found only one times at one station (BMP K7) with abundance - 1183 cells per litre and relative biomass -5%.
ADR references:	Joint HELCOM data (presented by Dr. Norbert Wasmund, Leibniz-Inst. for Baltic Sea Research, Seestr. 15, 18119 Warnem
Impact on communities:	C0
Impact on com. confidence level:	Medium
Impact on com. comments:	Appearance of <i>T.punctigera</i> did not change the phytoplankton structure in the area because the species was not abundant and its distribution in the area was confined to one locality only
Impact on habitats:	H0
Impact on hab. confidence level:	Medium
Impact on hab. comments:	Appearance of <i>T.punctigera</i> did not change the habitat because the species was not abundant and its distribution in the area was confined to one locality only
Impact on ecosystems:	C0
Impact on eco. confidence level:	Low
Impact on eco. comments:	No addition of a new functional group
BPL:	0
Contributor:	Irina Olenina